

# ASETSDefense

November 20, 2014



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# Agenda

- Overview of Coast Guard Ecoat research, ESTCP, and the Acquisition of E-Coat Equipment.
- Ecoat advantages, technology, and the AMS3144 Type 1 Class N specification
- E-Coat Machine Testing and coating parts.
- Future Projects for the Corrosion Program



# Protecting Our Assets



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# Electro-deposit Coating



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# ESTCP

Environmental Security Technology Certification  
Program (DoD)

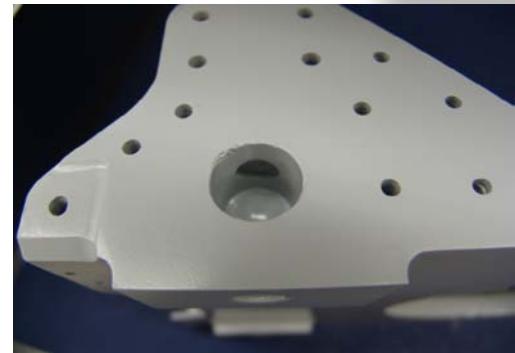
- Coast Guard invited to committee meetings
- Working with PPG and ESTCP the Coast Guard volunteered to demonstrate/evaluate the Ecoat process on aircraft parts.
- All was progressing forward until.....
- ESTCP said the CG is DHS not DoD so did not qualify to perform dem/val.
- Coast Guard decided to purchase machine.



# Electro-deposit Coating Technology



- This technology is unique (new) for aerospace but has been used in automotive and other industries with great success for many years.
- The AMS3144 specification has been approved for use in the aerospace industry.
- Material utilization is ~ 98% compared to standard spray primers of 30-35%.
- The parts can be handled right after application (about 90 seconds) and oven cure at 200F for 45 min - 1 hour.



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# Electro-deposit Coating Technology

- The Coast Guard is the first in the US to adopt this new process for aircraft parts.
- This Non-chrome process eliminates airborne and drastically reduces liquid waste (closed loop sys).
- Provides a uniform layer of coating in hard to reach areas such as insides of tubes and crevices.
- Improved quality, coverage, and adherence will enhance corrosion protection.
- Tank can coat parts up to 36"



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# Industrialization of Electro-Deposition Coating Application at the Aviation Logistics Center

Coast Guard Academy Cadet Research project



## # Parts to be coated

Product Line	Phase I	Phase II	Phase III
SRR	1519	3156	2751
MRR	1160	2614	2721
MRS	40	43	54
LRS	258	1301	1315



# Industrialization of Electro-Deposition Coating Application at the Aviation Logistics Center

Coast Guard Academy Cadet Research project



- Phase I will consist of using Ecoat to prime small parts which are categorized as non-structural
- Non-load bearing or secondary structure.
- Phase II will consist of using Ecoat to prime small and medium parts.
- Both non-structural and structural parts. This will allow for coating twice as many parts.



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# Industrialization of Electro-Deposition Coating Application at the Aviation Logistics Center

Coast Guard Academy Cadet Research project



- Phase III should not be seen as the goal of the Ecoat project, but as an outline of the potential possibilities to expand the ALC's electro coating abilities by purchasing larger tanks so that all new aluminum parts could be primed, regardless of whether the part is primary structure, secondary structure or non-structural





# Electro-deposit Coating Technology



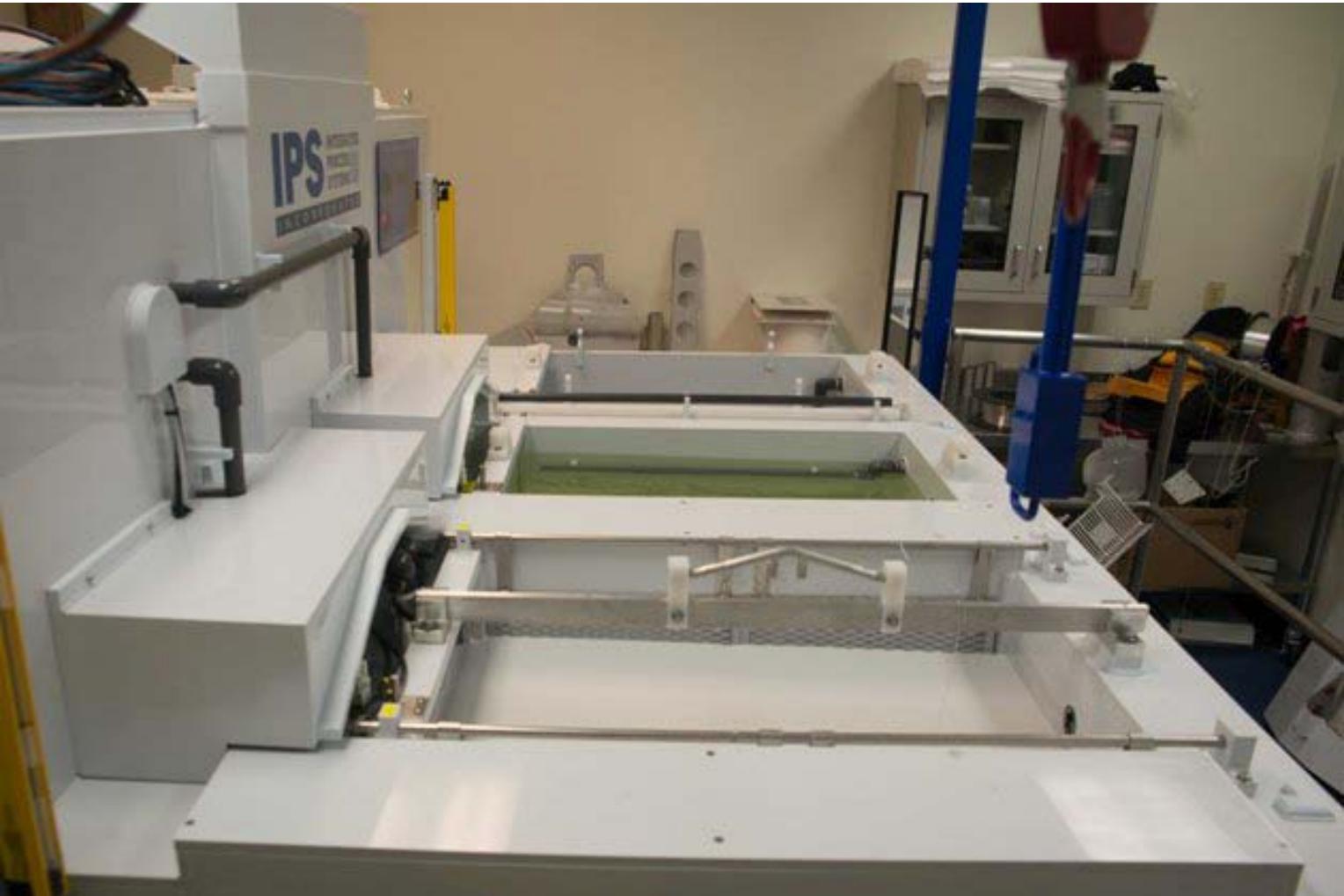
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# Electro-deposit Coating Technology



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# Parts





# Oven



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# Advantages of E-coat

## Environmental, Health and Safety

- Aqueous based – low solvent emission
- Minimal waste discharge – closed loop process
- Minimal exposure of workers to hazardous materials

## Productivity / Efficiency

- 90-95% material utilization / no overspray
- Immediate part handling after thermal cure

*No “dry to touch / tape / fly” restrictions*

## Application / Performance

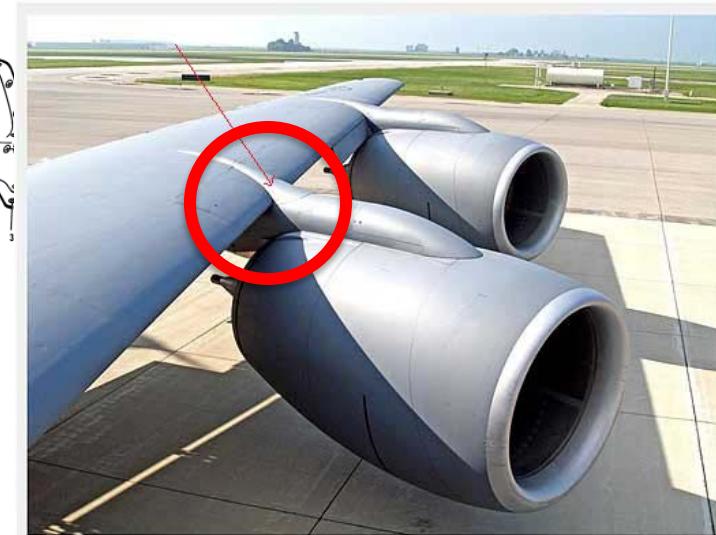
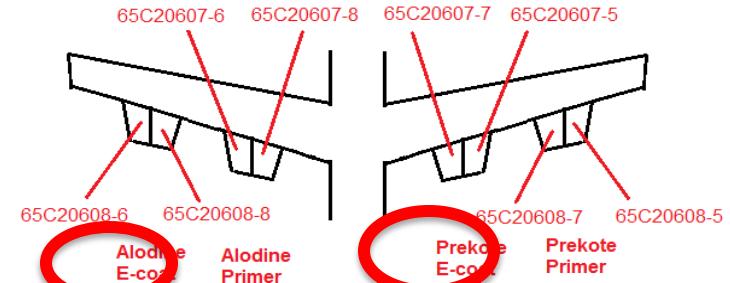
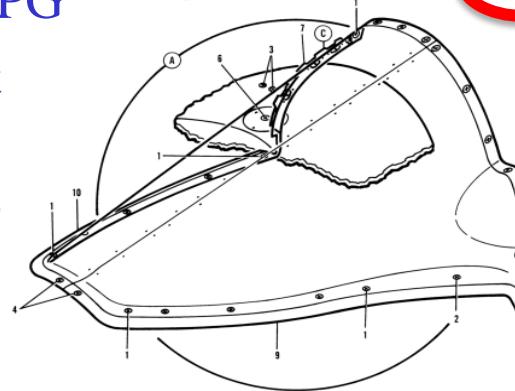
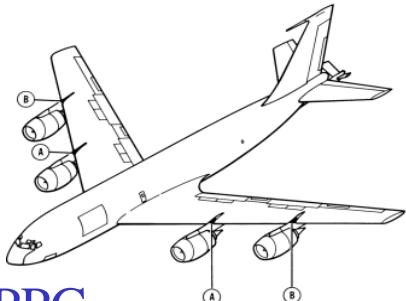
- Uniform film on entire surface including recessed areas
- Throwpower capability (holes/gaps) due to dip process
- Excellent barrier / corrosion resistance properties



# KC-135 Saddleback Fairings - (4 per aircraft)



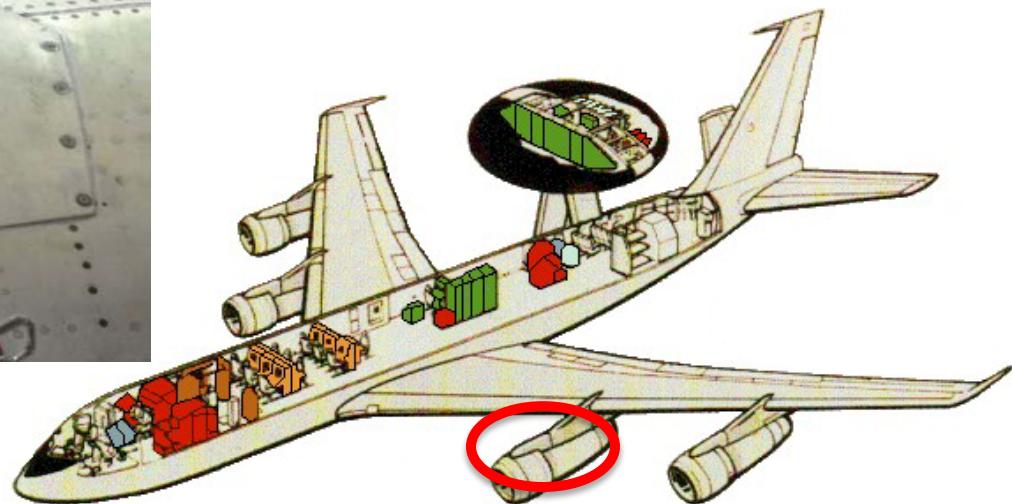
- Two aircraft
- E-coat applied at PPG
- Top coat applied at Tinker in the Commodities Shop (CMXG)
- One at harsh corrosion environment
- One at benign corrosion environment





# E-3 Saddleback Fairings - (4 per aircraft)

- Different location relative to engine than KC-135
- More exposure to engine heat
- Larger, more complex part



Distribu



# E-3 Latrine Door Access Panel - (1 per aircraft)



- Complex part exposed to corrosive fluids
- Coated with PreKote/ E-Coat (Aerocron 2100)/ MIL-PRF-85285 Ty I
- Steel hinges and latches removed before electrocoating.





## Future Projects

- Examine/test commercially available super hydrophobic coating known as “Never Wet”
- Examine the use of a non-chrome hard coat nano-coating that goes on in layers, somewhat like plywood, used on fasteners.
- Non-Chrome sealants



# Corrosion Program Office

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# Questions ?



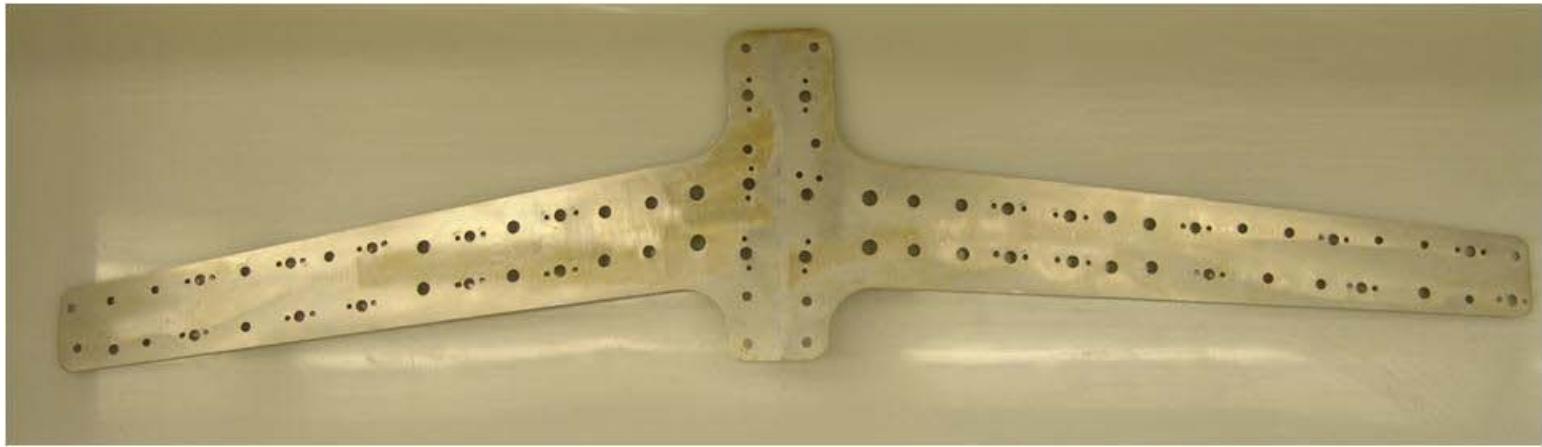
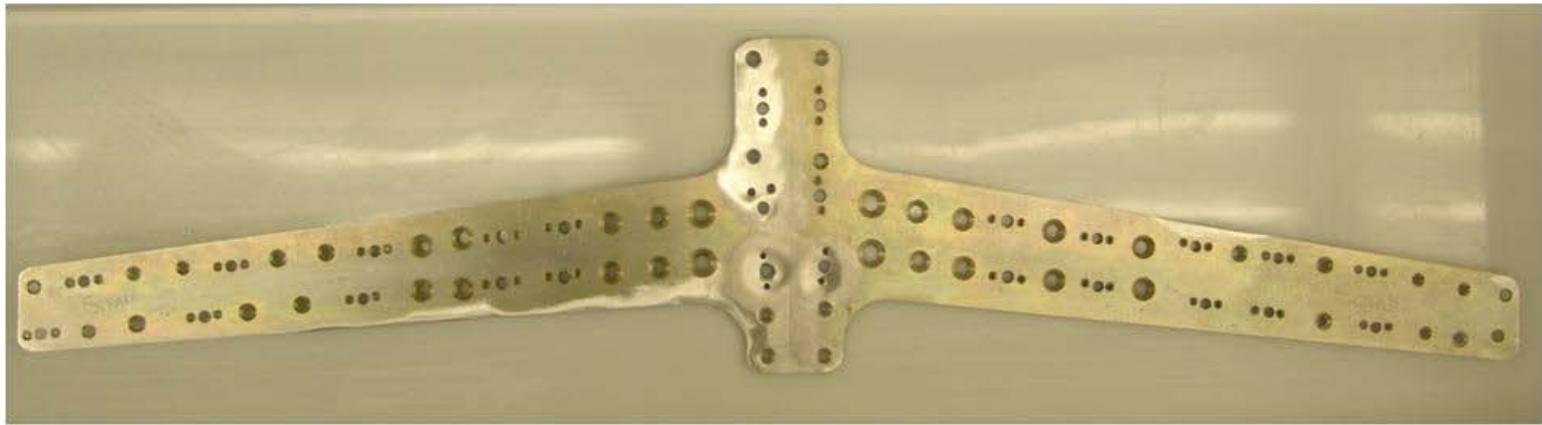
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# Test piece as-received



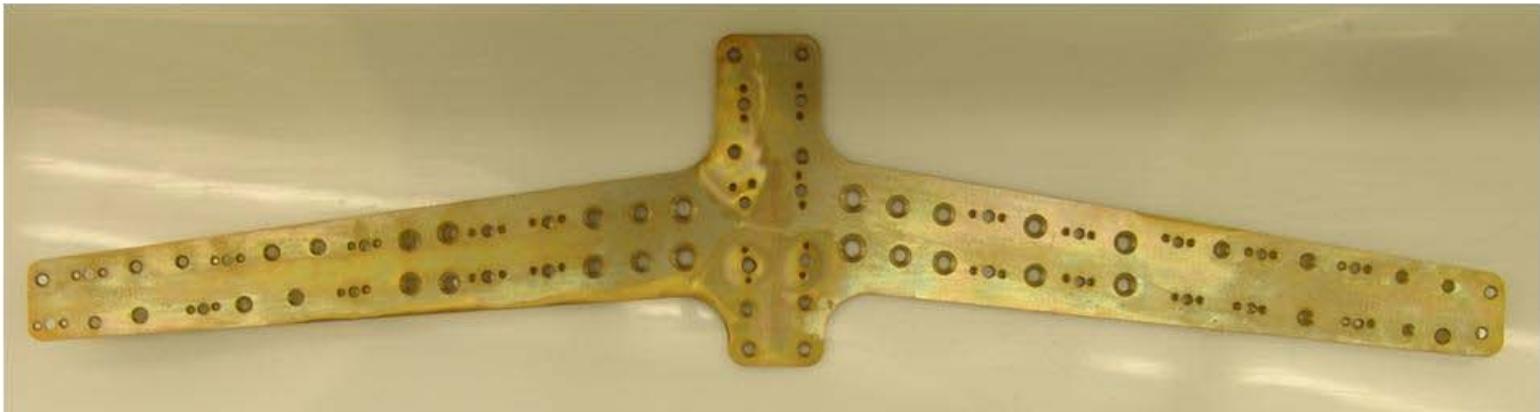
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# Test piece after Alodine



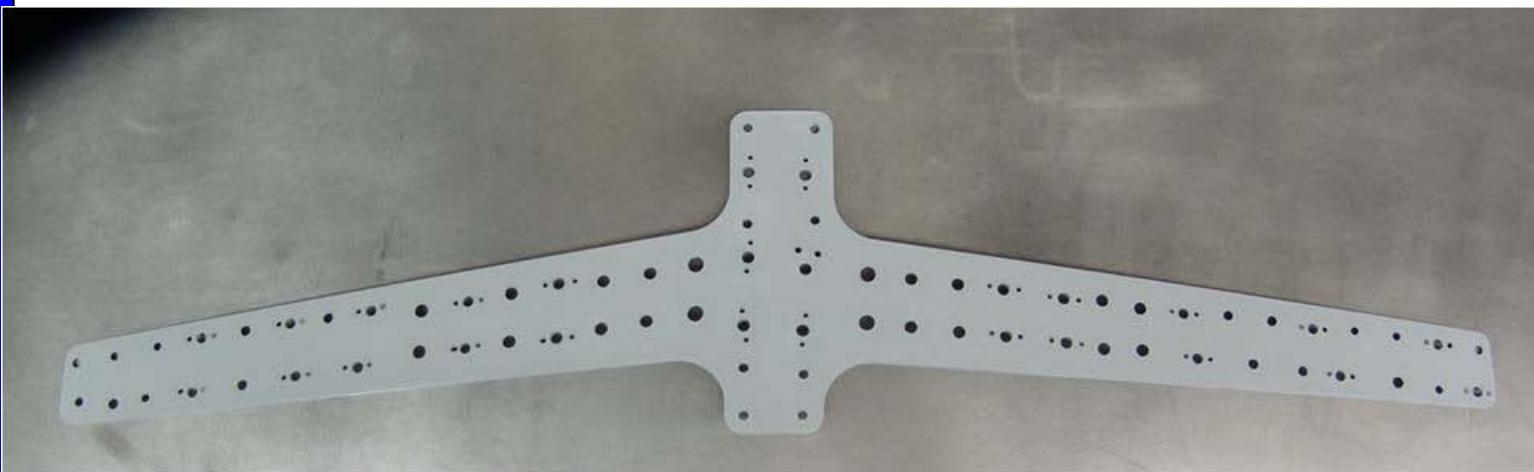
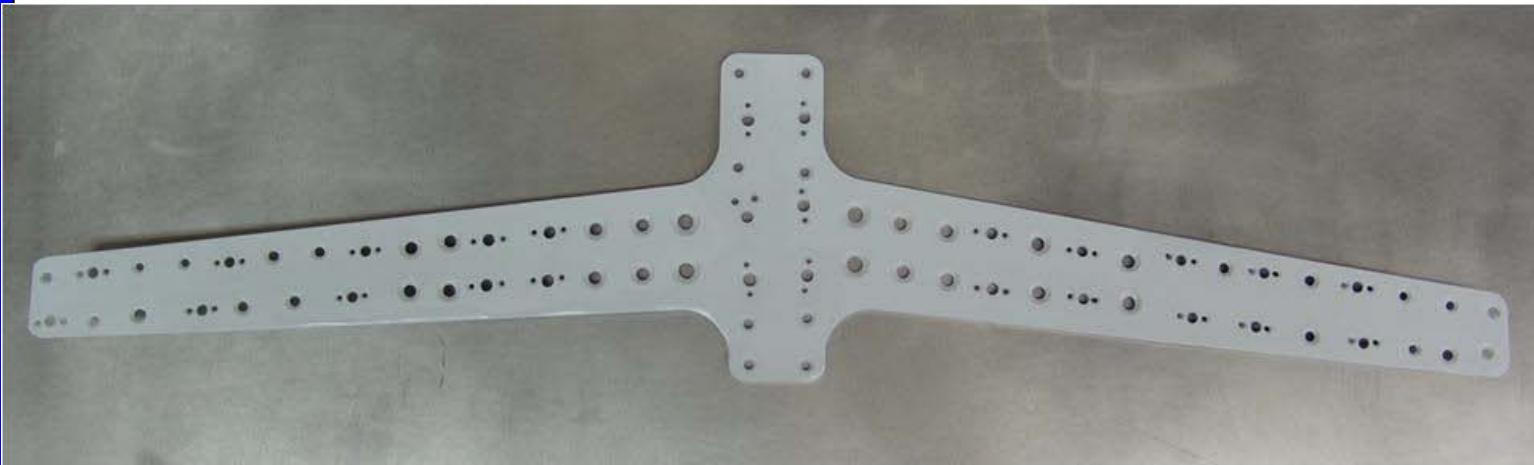
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# Test piece after electrocoat



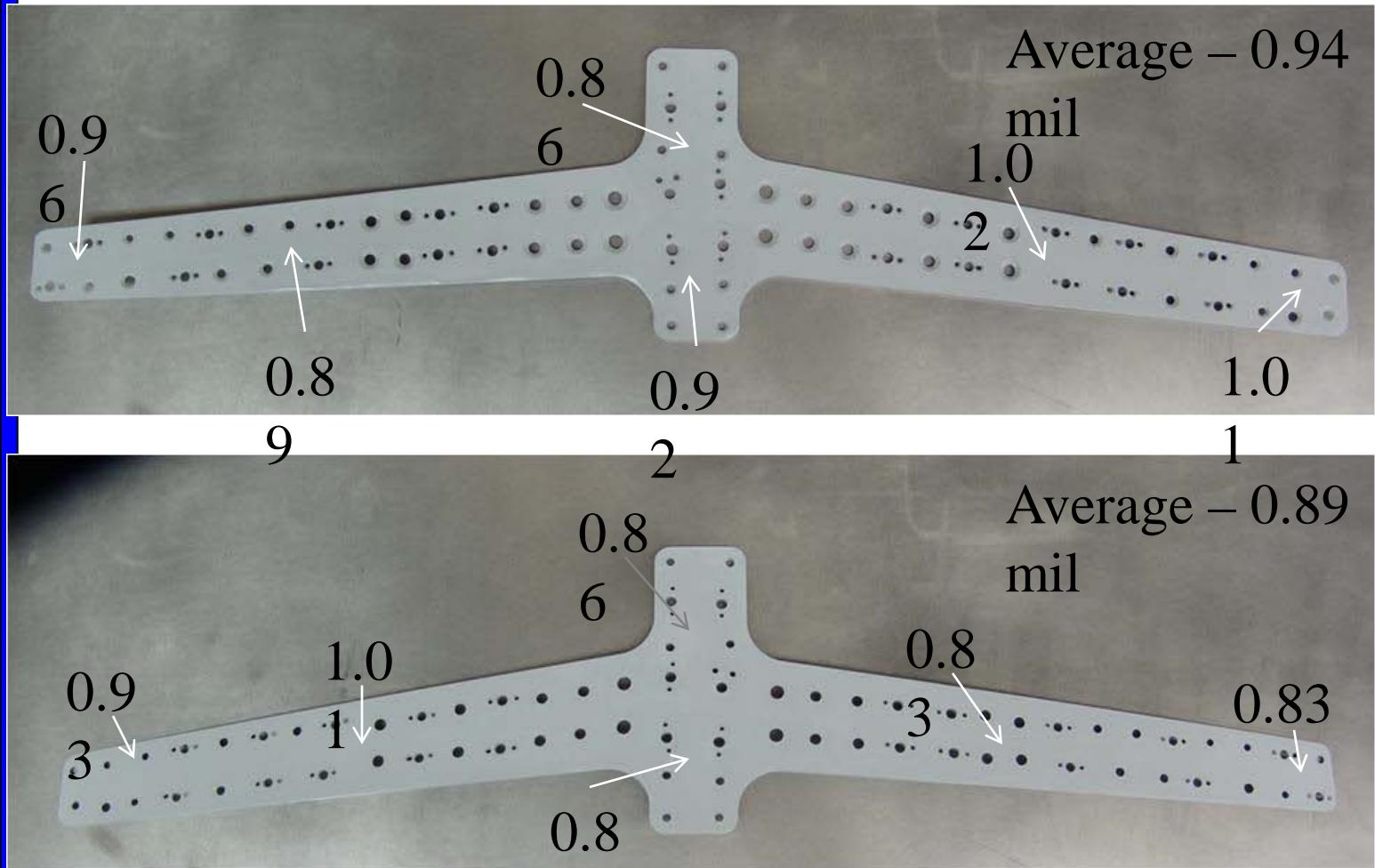
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# Film builds (mil)





# Examples of electrocoat coverage on countersinks

